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DIRECTORATE OF
INTELLIGENCE

Intelligence Handbook

Soviet Submarines

~~Secret~~
SR IH 69-5
December 1969

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
December 1969

INTELLIGENCE HANDBOOK

Soviet Submarines

Contents

This handbook was produced solely by CIA. It was prepared by the Office of Strategic Research and coordinated with the Foreign Missile and Space Analysis Center and the Office of Scientific Intelligence.

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Noise Radiation by Submarines

Data on radiated noise levels are included in this handbook because of their importance in antisubmarine operations. Noise levels are expressed in decibels referenced to a standard level (1 microbar at 1 yard). Submarines which register levels of 30-35 db in the low frequency band and 20-25 db in the sonar band are considered quiet in operation. Only limited noise level data are available on the new classes of Soviet submarines.

Submarine Launched Missiles

Characteristics of the ballistic and cruise missiles carried by Soviet submarines are given below.

Ballistic Missiles

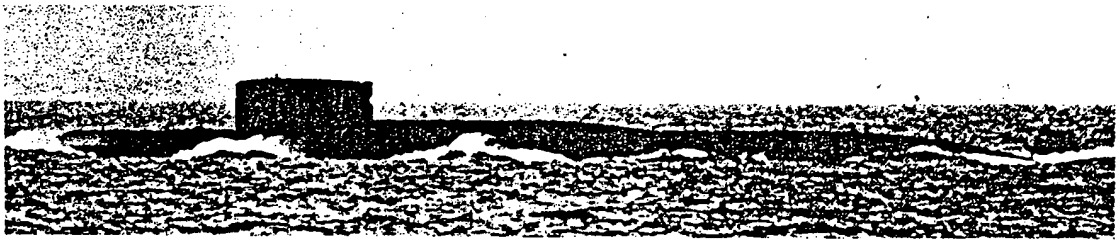
	SS-N-4	SS-N-5	SS-N-6	New Missile (SS-NX-5)
Configuration	single stage	single stage	single stage	unknown
Propellant	storable liquid	storable liquid	storable liquid	unknown
Launch mode	surfaced	submerged	submerged	submerged
Warhead weight	about 2,200 lbs	about 2,200 lbs	about 1,200 lbs	about 1,500 lbs
Maximum operational range	300 nm	650 nm	1,100 nm	about 3,000 nm
Estimated System Reliability	80%	[illegible]	[illegible]5%	[illegible] 75%
Carrying submarines	Z-V, G-I, H-I	G-II, H-II	Y	unknown, possibly H-III

SS-N-3 Cruise Missile

Type	rocket boosted turbojet
Guidance	preset autopilot with active terminal guidance, command override
Cruising speed	Mach 0.9 to 1.7
Maximum operational range	250 nm
Carrying submarines	modified W ("Long Bin" and "Twin Cylinder"), J, E-I, E-II

Nuclear Powered Ballistic Missile Submarine - SSBN

Y Class

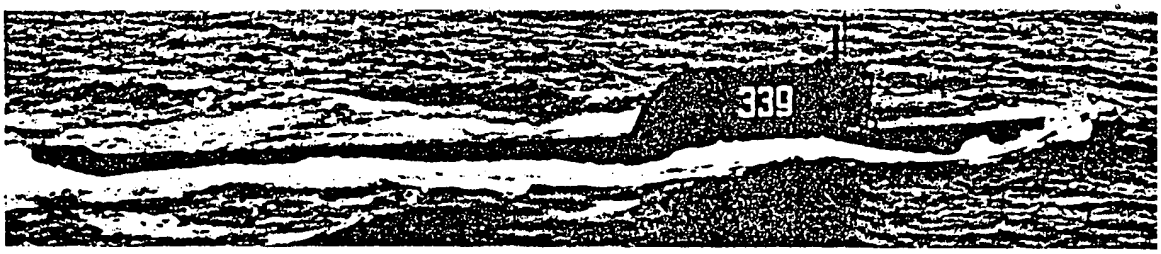


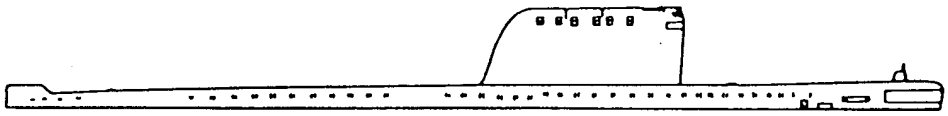
Production		
Construction start		
Severodvinsk		1964
Komsomol'sk		1966
Number completed by Dec 69		8
Characteristics		
Complement		about 100
Length		425 ft
Beam		38 ft
Displacement		
		7,200 tons
		8,700 tons
Propulsion	nuclea[illegible]	2 screws
Performance		
Operating depth		
normal		1,[illegible] ft
collapse		2,000 ft
Submerged speed	at least	26.7 kts
Patrol radius		
10 days on station		7,200 nm
20 days on station		5,800 nm
Patrol duration		60 days
Noise levels	at 7 kts,	12 kts
low frequency	55-60 db	62 db
sonar band	25 db	30 db
Armament		
Ballistic missiles		16 SS-N-6
Torpedoes		18

This new Polaris type submarine is being built at Severodvinsk and Komsomol'sk at a combined rate of six to eight units per year. Y class submarines started making operational patrols in the North Atlantic in June 1969, and the single unit in the Pacific could deploy in early 1970.

Nuclear Powered Ballistic Missile Submarine - SSBN

H Class



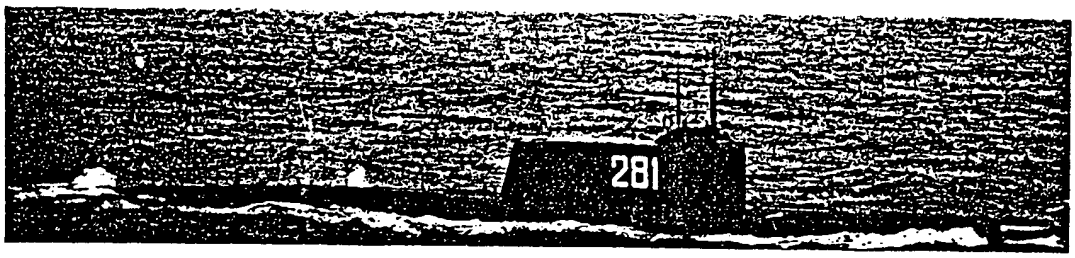


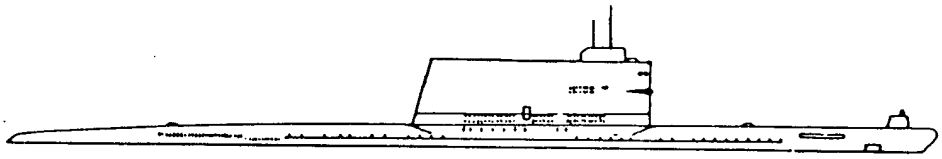
Production	
Construction period	1959-63
Number built	9
Characteristics	
Complement	100
Length	380 ft
Beam	30 ft
Displacement	
surfaced	4,100 tons
submerged	5,100 tons
Propul[illegible]	nuclear, 2 screws
[illegible]h	
	1,000 ft
collapse	
Max[illegible] submerged speed	25.9 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels at 6.5 kts,	13 kts
low frequency 60 db	72 db
sonar band 18 db	32 db
Armament	
Ballistic missiles (carried in sail)	3 SS-N-5
Torpedoes	22

The program to convert the H-I class, which carried the SS-N-4 missile, to the H-II class probably will be completed in 1969. A modified unit (designated H-III) has six missile tubes in an enlarged sail, possibly to test a new 3,000 nm missile.

Ballistic Missile Submarine - SSB

G Class



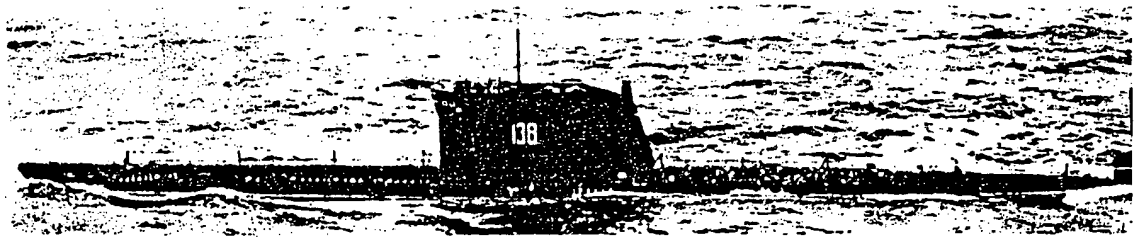


Production	
Construction period	1958-62
Number built	23
Characteristics	
Complement	85
Length	320 ft
Beam	28 ft
Displacement	
surfaced	2,300 tons
submerged	2,800 tons
[illegible]sion	diesel, 3 screws
Performance	
Operating depth	
normal	1,000 ft
collapse	1,500 ft
Submerged speed	
maximum	[illegible] kts for 14 nm
economical	3 kts for 300 nm
Patrol radius	
10 days on station	3,000 nm
20 days on station	2,400 nm
Patrol duration	60 days
Noise levels	at 6 kts
	snorkel / battery
low frequency	60 db / 45 db
sonar band	32 db / 6 db
Armament	
Ballistic missiles (carried in sail)	3 SS-N-4 or SS-N-5
Torpedoes	22

A program to convert G-I class submarines to the G-II class to fire the SS-N-5 missile is about half completed. Some components for one G class unit were supplied to Communist China.

Ballistic Missile Submarine - SSB

Z-V Conversion Class

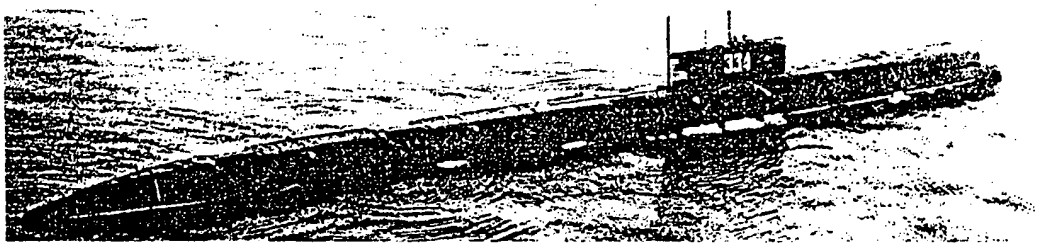


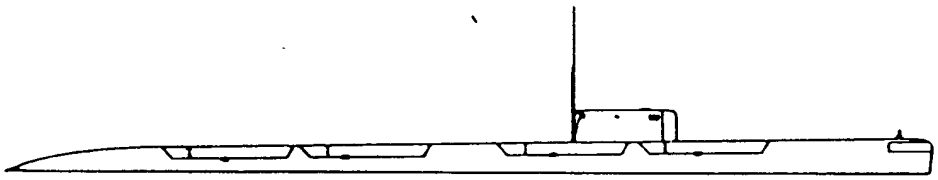
Production	
Conversion period	1955-58
Number converted	6
Characteristics	
Complement	80
Length	295 ft
Beam	26 ft
Displacement	
surfaced	2,000 tons
submerged	2,400 tons
Pro[illegible]	
Per[illegible]	
[illegible]	750 ft
collapse	1,100 ft
Submerged speed	
maximum	14 kts for 14 nm
economical	3 kts for 250 nm
Patrol radius	
10 days on station	3,000 nm
20 days on station	2,400 nm
Patrol duration	60 days
Noise levels	at 6 kts
	snorkel / battery
low frequency	60 db / 45 db
sonar band	32 db / 6 db
Armament	
Ballistic missiles	2 SS-N-4
Torpedoes	22

Conversion of the Z class was the initial Soviet effort to equip a submarine with ballistic missiles. These units probably will be phased out of service by 1973. One unit has been reconverted to a torpedo attack submarine.

Nuclear Powered Cruise Missile Submarine - SSGN

E-II Class



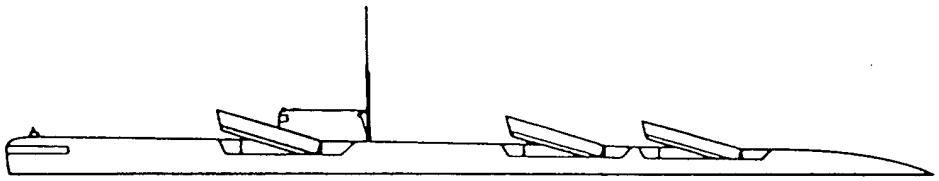


Production	
Construction period	1962-67
Number built	28
Characteristics	
Complement	100
Length	385 ft
Beam	30 ft
Displacement	
surfaced	4,200 tons
submerged	5,200 tons
Propulsion	nuclear, 2 screws
Performance	
Operating depth	
normal	1,300 ft
collapse	2,000 ft
Maximum submerged speed	24.9 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels	at 6 kts, 12 kts
low frequency	60 db 72 db
sonar band	18 db 32 db
Armament	
Cruise missiles	8 SS-N-3
Torpedoes	22

This class was built in Northern and Pacific fleet shipyards. E-II class submarines are targeted primarily against carrier forces and patrol the transit routes to the Far East, Norwegian Sea, and Atlantic. E-II submarines also alternate with N class attack submarines on Mediterranean patrol.

Nuclear Powered Cruise Missile Submarine - SSGN

E-I Class



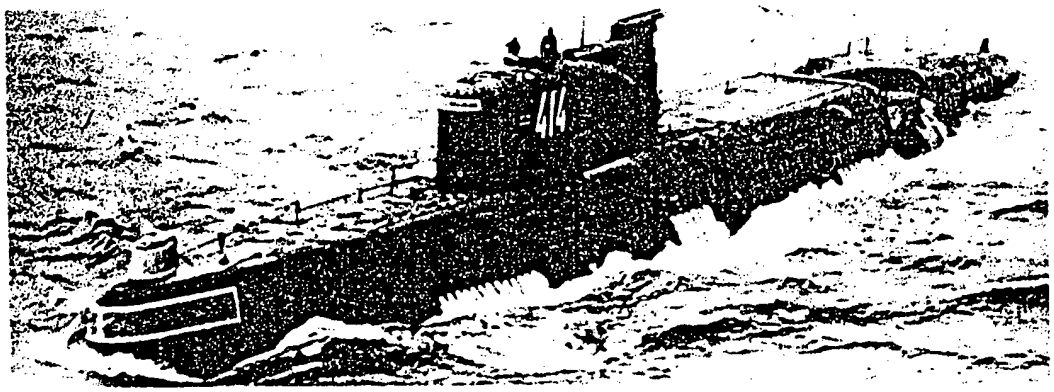
Missile-launching tubes in elevated position

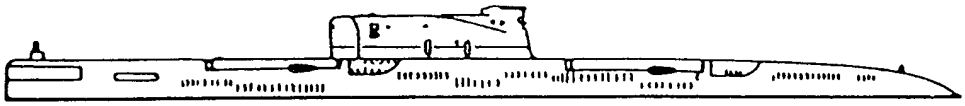
Production	
Construction period	1960-62
Number built	5
Characteristics	
Complement	100
Length	375 ft
Beam	30 ft
[illegible] ent	
	4,000
[illegible]	[illegible]ons
[illegible]	[illegible], 2 scre[illegible]
Operating depth	
normal	1,000 ft
collapse	1,500 ft
Maximum submerged speed	25.9 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels at 6 kts,	13 kts
low frequency 60 db	72 db
sonar band 18 db	32 db
Armament	
Cruise missiles	6 SS-N-3
Torpedoes	22

All E-I class submarines were built in Pacific Fleet shipyards. The missile tubes on at least one of these units have been removed, suggesting that these submarines will be reassigned to surveillance and antisubmarine roles.

Cruise Missile Submarine - SSG

J Class





Production	
Construction period	1962-69
Number built	
Characteristics	
Complement	80
[illegible]	[illegible] ft
[illegible]	2,8[illegible] tons
submerged	3,500 tons
Propulsion	diesel, 2 screws
Performance	
Operating depth	
normal	1,300 ft
collapse	2,000 ft
Submerged speed	
maximum	15 kts for 15 nm
economical	3 kts for 300 nm
Patrol radius	
10 days on station	3,000 nm
20 days on station	2,400 nm
Patrol duration	60 days
Armament	
Cruise missiles	4 SS-N-3
Torpedoes	22

Construction of this class has ended. J Class submarines are making regular patrols in the North Atlantic and Mediterranean after an unexplained two year absence.

Cruise Missile Submarine - SSG

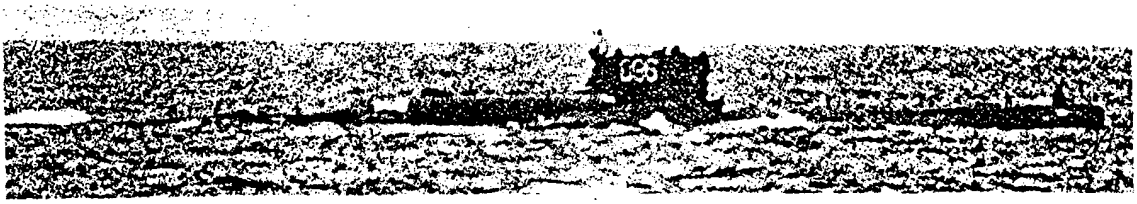
W Conversion Class ("Long Bin")

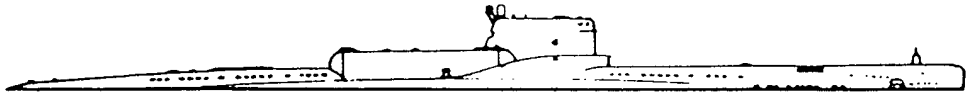
Production	
Conversion period	1962-64
Number converted	7
Characteristics	
Complement	60
Length	275 ft
[illegible]	23 ft
Displacement	
surfaced	1,[illegible] tons
submerged	1,500 tons
Propulsion	diesel, 2 screws
Performance	
Operating depth	
normal	656 ft
collapse	984 ft
Submerged speed	
maximum	12 kts for 12 nm
economical	2.5 kts for 250 nm
Patrol radius	
10 days on station	1,800 nm
20 days on station	1,200 nm
Armament	
Cruise missiles	4 SS-N-3
Torpedoes	10

The Long Bin is a W class hull with a 25 foot section added, a new sail, and four missile launchers. These submarines do not operate outside Soviet waters.

Cruise Missile Submarine - SSG

W Conversion Class ("Twin Cylinder")



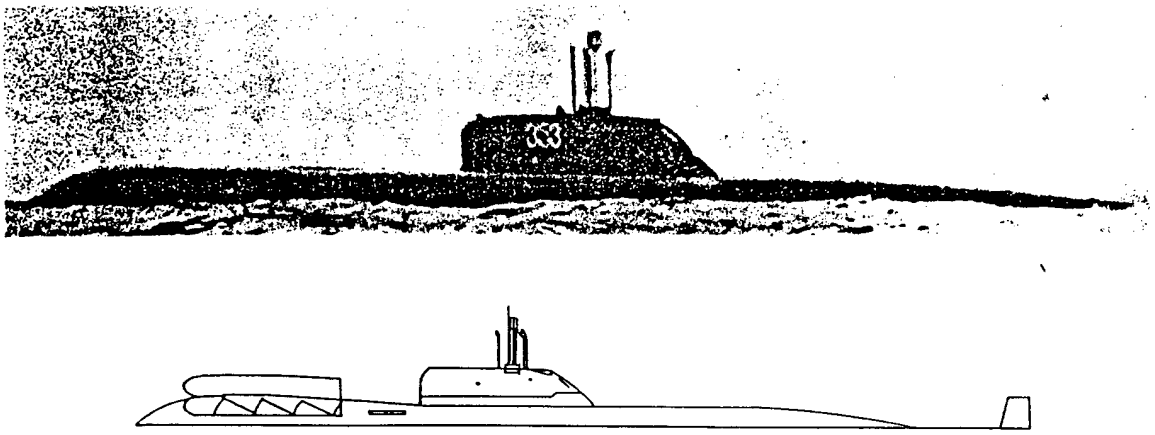


Production	
Conversion period	1961-62
Number converted	5
Characteristics	
Complement	55
Length	249 ft
[illegible]	[illegible]
[illegible]	[illegible] tons
Propulsion	diesel, 2 screws
Performance	
Operating depth	
normal	656 ft
collapse	984 ft
Submerged speed	
maximum	12 kts for 12 nm
economical	2.5 kts for 250 nm
Patrol radius	
10 days on station	1,800 nm
20 days on station	1,200 nm
Armament	
Cruise missiles	2 SS-N-3
Torpedoes	12

The Twin Cylinder is a standard W class fitted with two missile launchers aft of the sail. These submarines do not operate outside Soviet waters.

Nuclear Powered Torpedo Attack Submarine - SSN

C Class

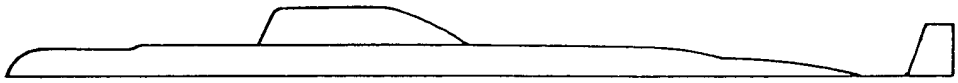


Production	
Construction start	1964
Number completed by Dec 69	3
Characteristics	
[illegible]lement	about 80
	300 ft
	34 ft
Displacement	
surfaced	4,400 tons
submerged	
Prop[illegible]	nuclear
Performance	
Operating depth	
normal	1,300 ft
collapse	2,000 ft
Submerged speed	about 30 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels	at 5 kts, 14 kts
low frequency	55-60 db 65 db
sonar band	16 db 22 db
Armament	
Missiles	8, of undetermined short range type
Torpedoes	18

This class is being built at Gor'kiy. Eight missile tubes installed near the bow are probably for use against surface or submerged targets at ranges of less than 50 miles. This submarine is equipped with a powerful low frequency sonar.

Nuclear Powered Torpedo Attack Submarine - SSN

V Class



Production	
Construction start	1964
Number completed by Dec 69	6
Characteristics	
Complement	about 80
Length	300 ft
Beam	33 ft
Displacement	
surfaced	[illegible]
submerged	[illegible]
Propulsion	nuclear
Performance	
Operating depth	
normal	1,300 ft
collapse	2,000 ft
Submerged speed	about 30 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels	at 5 kts, 14 kts
low frequency	55-60 db 65 db
sonar band	16 db 22 db
Armament	
Torpedoes	32

This submarine is being built at Leningrad. It appears to be a follow-on to the N class and most likely is intended for use against surface ships and for reconnaissance missions.

Nuclear Powered Torpedo Attack Submarine - SSN

A Class

Production

Construction start	1967

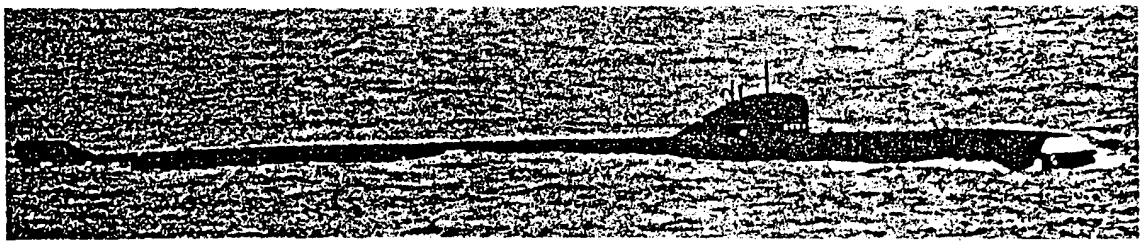
Characteristics

Length	240 ft
Beam	about 30 ft
[illegible]	robably nuclear

The Sudomekh shipyard at Leningrad, builder of this new class, can produce about two units per year. The first unit was launched in April 1969 and is now nearly complete.

Nuclear Powered Torpedo Attack Submarine - SSN

N Class

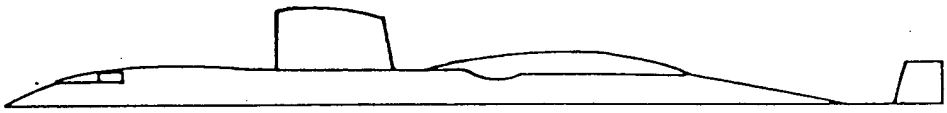


Production	
Construction period	1956-66
Number built	15
Characteristics	
Complement	90
Length	360 ft
Beam	30 ft
Displacement	
surfaced	4,000 tons
submerged	4,800 tons
Propulsion	nuclear, 2 screws
Performance	
Operating depth	
normal	1,000 ft
collapse	1,500 ft
Maximum submerged speed	30 kts
Patrol radius	
10 days on station	7,200 nm
20 days on station	5,800 nm
Patrol duration	60 days
Noise levels	at 7 kts, 15 kts
low frequency	60 db 72 db
sonar band	18 db 32 db
Armament	
Torpedoes	32

The N class was the first nuclear powered submarine built by the USSR. Its primary missions are open ocean surveillance and attack against surface ships.

Torpedo Attack Submarine - SS

B Class

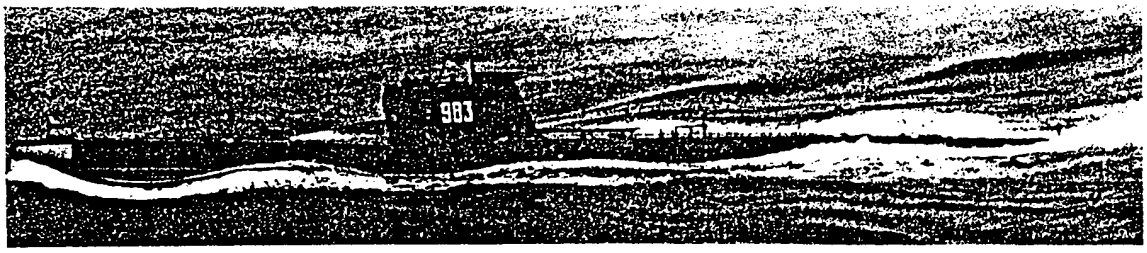


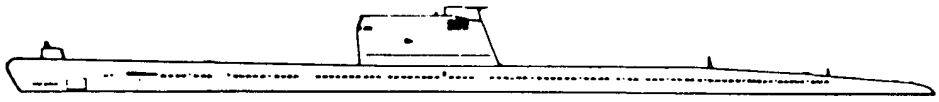
Production	
Construction start	1966
Number completed by Dec 69	4
Characteristics	
Complement	about 75
Length	276 ft
Beam	30 ft
[illegible]	[illegible]
	2,400 tons
	2,900 tons
[illegible]	diesel
Performance	
Operating depth	
normal	1,300 ft
collapse	2,000 ft
Submerged speed	about 22 kts
Patrol radius	
10 days on station	3,000 nm
20 days on station	2,400 nm
Armament	
Torpedoes	18

This short hulled submarine is being built at Komsomol'sk. It probably will be used to patrol Soviet coastal waters. Diesel propulsion and limited endurance reduce its effectiveness against nuclear submarines operating in the open ocean.

Torpedo Attack Submarine - SS

F Class



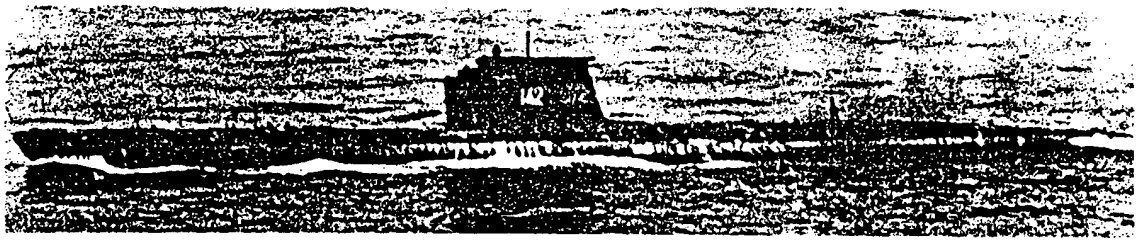


Production		
Construction period		1957-68
Number built		48
Characteristics		
Complement		79
Length		300 ft
Beam		25 ft
Displacement		
surfaced		[illegible] ft
[illegible]	diesel, 3 screws	
[illegible]		
[illegible]		
[illegible]		920 ft
collapse		1,400 ft
Submerged speed		
maximum	16.2 kts for 16.2 nm	
economical	2 kts for 400 nm	
Patrol radius		
10 days on station		3,000 nm
20 days on station		2,400 nm
Patrol duration		60 days
Noise levels	at 6 kts	
	snorkel	battery
low frequency	60 db	45 db
sonar band	32 db	6 db
Armament		
Torpedoes		22

Some six to eight units of this class, one of the best diesel submarines of any country, normally operate in the Mediterranean. F class submarines are being sold to India.

Torpedo Attack Submarine - SS

Z Class

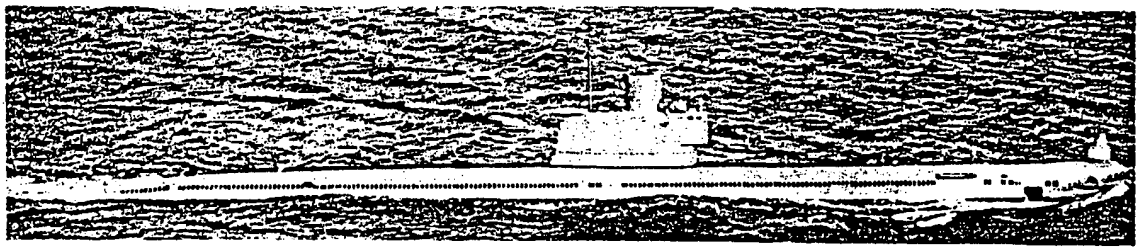


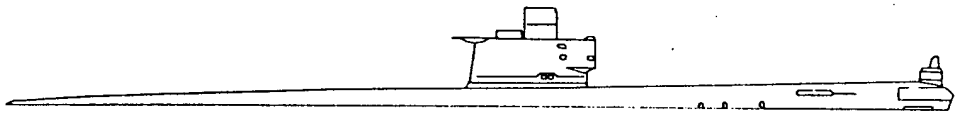
Production		
Construction period		1951-56
Number built		20
Characteristics		
Complement		74
Length		295 ft
Beam		26 ft
Displacement		
surfaced		2,100 tons
submerged		2,500 tons
Propulsion		diesel, 3 screws
Performance		
Operating depth		
normal		750 ft
collapse		1,100 ft
Submerged speed		
maximum		15 kts for 15 nm
economical		2 kts for 400 nm
Patrol radius		
10 days on station		3,000 nm
20 days on station		2,400 nm
Patrol duration		60 days
Noise levels	at 6 kts	
	snorkel	battery
low frequency	60 db	45 db
sonar band	32 db	6 db
Armament		
Torpedoes		22

A few Z class units have been modified as test platforms for a large new sonar. The new sonar, or an improved version of it, probably is being installed in the new attack submarines currently being built in the USSR.

Torpedo Attack Submarine - SS

R Class



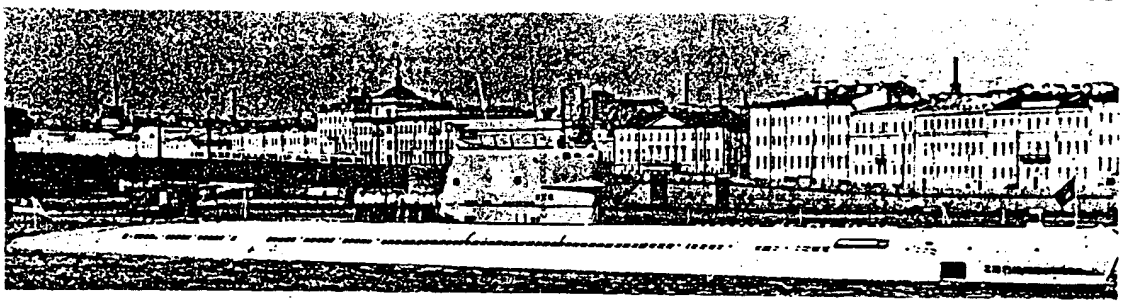


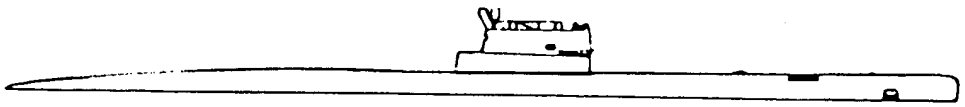
Production	
Construction period	1958-62
Number built	20
Characteristics	
Complement	59
Length	250 ft
Beam	23 ft
Displace	
	1,800 tons
Propulsion	
Operating depth	
normal	920 ft
collapse	1,400 ft
Submerged speed	
maximum	15.5 kts for 15.5 nm
economical	2.5 kts for 300 nm
Patrol radius	
10 days on station	1,800 nm
20 days on station	1,200 nm
Patrol duration	40 days
Noise levels	at 6 kts
	snorkel / battery
low frequency	60 db / 45 db
sonar band	32 db / 6 db
Armament	
Torpedoes	18

The USSR has provided six R class units to Egypt. Communist China is building submarines of this class.

Torpedo Attack Submarine - SS

W Class





Production	
Construction period	1950-57
Number built	235
Characteristics	
Complement	54
Length	249 ft
Beam	21 ft
Displacement	
surfaced	1,055 tons
submerged	1,355 tons
Propulsion	diesel, 2 screws
Performance	
Operating depth	
normal	656 ft
collapse	984 ft
Submerged speed	
maximum	13.5 kts for 13.5 nm
economical	2.5 kts for 300 nm
Patrol radius	
10 days on station	1,800 nm
20 days on station	1,200 nm
Patrol duration	40 days
Noise levels	at 6 kts
	snorkel / battery
low frequency	60 db / 45 db
sonar band	32 db / 6 db
Armament	
Torpedoes	12

The USSR has transfered more than 30 W class submarines to other Communist countries and to Indonesia and Egypt. Some W class units have been built in China from sections prefabricated in the USSR. The Soviets have modified a few units for testing new electronic equipment.